NEW JERSEY SHIP CANAL
EFFECT UPON POTABLE WATERS

State Water Policy Commission
November 15, 1943

supply + Water Analysis (large)

STATE OF NEW JERSEY

STATE WATER POLICY COMMISSION

NEW JERSEY SHIP CANAL

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Report

To the Senate of the State of New Jersey

November 15, 1943

Water Supply & Water Analysis (large)

New Jersey

New

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RESOLUTION OF NEW JERSEY SENATE

Adopted August 12, 1943

Requesting Report

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STATE OF NEW JERSEY

STATE WATER POLICY COMMISSION

November 15, 1943

To the Senate of
the State of New Jersey.

In obedience to the directions contained in the Senate Resolution of August 12, 1943, the State Water Policy Commission respectfully submits the requested information and advice respecting relationship of the proposed Federal Ship Canal across New Jersey to the present and potential water supplies of the State.

Below is a summary of the conclusions and recommendations of the Commission with respect to the proposed Ship Canal and also with respect to the general water supply problem of the State. A detailed report follows.

SUMMARY AND RECOMMENDATIONS

1. The Proposed Ship Canal

a. The canal will take an immense quantity of water from the Raritan and Delaware River watersheds.

b. The Federal Government has unlimited power, under the Constitution, to take whatever water it needs; the State has no recourse.

c. The Army Engineers, to whom the case has been referred by the Congress, have been very cooperative and have assured the State Water Policy Commission that nothing will be done to the detriment of State interests until the State has had an opportunity to be heard.

d. The Army Engineers request that the State's plan for use of the waters of the Raritan and Delaware Rivers be presented to them with-

in a reasonable time.

The State's policy on water supply with respect to the Delaware and Raritan Rivers should be determined without delay. When that policy is determined it is recommended that the State Water Policy Commission be authorized to represent the State in negotiations with the Army Engineers.

2. The Water Supply Problem of the State

a. The water supply problem of the State is complex in the North Jersey industrial area.

b. This North Jersey area is now supplied by 33 separate agencies, which can safely be counted on for a total of not more than 325,000,000 gallons of potable water daily. Consumption during much of the current year has exceeded this figure.

c. The variation in water consumption depends almost wholly on industrial activity, the future of which no one can predict. It is the duty of our officials to make sure that, regardless of conditions, our citizens and our industries have plenty of water.

d. The present operating agencies have no funds to build the additional supplies which should be constructed, and which have been recommended from time to time by several State and District agencies.

e. Construction should be planned in detail immediately, so that work can start as soon as the war ends, both to provide for possible industrial expansion and to furnish employment.

f. When the State's policy on water supply has been determined, then it is suggested that the Legislature might authorize the State Water Policy Commission to utilize the balance remaining in the "Interconnection Revolving Fund, Chapter 24, P.L. 1942," to develop in detail a

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solution of our water supply problem and to proceed with the detailed design thereof.

FEDERAL SHIP CANAL vs. POTABLE WATER SUPPLIES

Revision of Plans for the Canal's Supply of Water

The Rivers and Harbors Committee of the United States House of Representatives on June 25, 1943, passed a resolution requesting the War Department Corps of Engineers to review its report on the canal "with a view to determining whether any change in the plans for the water supply are advisable."

Study of possible changes in plans for supplying the water which the canal will require has been assigned to the New York District Office of the Corps of Engineers, where it is proceeding under the immediate direction of the officer in charge, Colonel A. B. Jones, District Engineer. The Commission has conferred with Colonel Jones by letter, and on two occasions at conferences in his office.

Thorough studies have been undertaken by the Army Engineers to devise ways of constructing the canal with a minimum interference to the present or potential water supplies of the State of New Jersey. To this end the Commission has been requested by Colonel Jones to furnish him "with a detailed statement of present plans of your Commission, or of others, for the future use of Raritan waters."

The Commission has informed the Colonel that it has no authority to do more than make recommendations to the Legislature. Hence, it would have to submit his request to the Legislature for instructions. No statement of plans by the Commission would be binding upon the State under existing provisions of law.

The Commission discussed with Colonel Jones the prospects of a cooperative development of the watershed of the Raritan River and its headwaters, whereby use of water by the State for potable purposes might be determined in conjunction with, or even as part of, a Federal project to store water for the canal, with adequate allowance for the interests of each. The possibility was viewed with favor by him and in a subsequent letter to the Commission he has stated: "I see no fundamental objection to the proposal. If you will submit an outline of what you consider might be an acceptable joint project, I shall be glad to consider it. It would be quite within my authority to recommend such a combined project as an alternative to the development of ship canal storage by the United States alone."

The State Water Policy Commission has no authority to speak for the State in this instance, either, and awaits the pleasure of the Legislature.

Steps in the current study of the problem by the Corps of Engineers include, as stated by Colonel Jones:

(a) Hydraulic model studies of salt-proof locks in the hope of reducing the quantity of fresh water required by the canal. These are being conducted at the United States Waterways Experiment Station at Vicksburg, Mississippi. The purpose is to determine the extent to which salinity of the canal might affect ground water supplies already in operation east of the canal and the Delaware River below Trenton. That is a potential danger to which the State Water Policy Commission called attention at the public hearing on the canal held in Washington, March 9, 1943.

(b) Changes in the locking devices at Sayreville and Bordentown, where the canal would connect, respectively, with Raritan Bay and Delaware

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(b) [illegible]

River. A considerable saving in water consumption may be possible by the construction of a series of parallel locks of various sizes at either end of the canal. The quantity of salt water entering the canal might be reduced substantially by this means. Boats of small size would be passed through small locks, thereby making it unnecessary to open large locks with their correspondingly larger requirement of water.

(c) Construction of a dam near Cannonsville on the West Branch of the Delaware River in New York State for the impounding of sufficient water as a supplemental supply for the canal, and to increase the low flow of that river up to the flow fixed by the Supreme Court of the United States. Such a development might be controlled in a manner to increase the low flow of the river to the benefit of pollution abatement and salinity control below Phillipsburg and Trenton. The West Branch of the river is above and beyond the East Branch, which is to be utilized as the third step in the expansion of New York City's water supply. The impounding of water on this uppermost section of the river would relieve the draft on the storage reservoir which it is planned to create by damming the Raritan River at a location immediately below the confluence of its north and south branches.

(d) Consideration of changes in the contemplated storage reservoir on the Raritan River, in light of knowledge to be gained from the foregoing studies. No conclusions on this phase of the canal plans will be reached by the Army Engineers until the State of New Jersey has had reasonable time to determine and to declare its purposes respecting the use of the river and its watershed for a supply of potable water.

The effect on our potential water supply requirements, of a canal reservoir, on this river, would be so definitely far-reaching, the

State Water Policy Commission advises the Legislature of the importance of determining immediately the extent to which the State will require water from this source.

Papers prepared by the engineers of the Commission, setting forth complete information of the respects in which said canal might lessen, or injure, present and potential water supplies of the State, accompany this report (Supplement A). They were submitted to the Congressional committee in its early consideration of the canal. They, admittedly, have given that committee its chief concern in the matter of legislation for the authorization of the canal and were the direct reason for the postponement of a vote on the canal bill.

FEDERAL vs. STATE RIGHTS

Opinion of State's Attorney General

The State Water Policy Commission made a formal request upon the Attorney General of the State for an opinion as to whether the State might possess a prior right to its waters for potable purposes -- particularly those of a wholly intrastate stream like the Raritan River. With this question there was involved a related question as to the extent to which the canal plans might interfere with existing water supplies down-river from the Canal Storage Reservoir.

The Attorney General replied -- "The Federal Government, under its power to regulate commerce with foreign nations, and among the several States, and with the Indian tribes (Article I, Section VIII, Par. 3) has the paramount right to use all the available facilities in a State for the purpose of regulating commerce under the clause in question. I understand that the question submitted concerns the right of the Federal Government

to take potable water from any of our natural streams for the purpose of filling a canal to be used in furtherance of the commerce clause referred to. This, I think, is the paramount right of the Federal Government."

The Attorney General's opinion on two related questions follows:

1. Would the State's right be enhanced if the State were to take action looking to the construction of a reservoir for potable water purposes by acquiring the site for the dam prior to the construction of the canal by the Government?

Answer. "The State's rights would not, in my opinion, be enhanced by the acquisition at this time of a location for the construction at some future date of a reservoir for storing potable water. Such right as the State now has must give way to the superior right of the Federal Government, under the commerce clause above referred to."

2. Has the State of New Jersey a right to intercept and use for potable purposes water let down from the canal feeder basin while in transit to the canal?

Answer. "This inquiry must be answered in the negative. If the Federal Government needs the water for canal purposes, certainly its rights are superior to those of the State, under the commerce clause just referred to, and this State would have no right to interfere in the slightest with the Federal project."

The Attorney General added orally that the Federal Supreme Court's definition, in which it said that "drinking and other domestic purposes are the highest uses of water" (Supreme Court of the United States, February 24, 1931, Connecticut v. Massachusetts), does not modify the Federal Government's constitutional right to use State waters as it pleases for interstate and foreign commerce.

The question (2) respecting water let down from the canal basin, or feeder reservoir, was prompted by the fact that the plans for the canal contemplate adding this "let-down" to the natural flow of the river as it may be required to operate the canal from time to time. The water would be carried in the river to the canal near Sayreville and not via artificial conduits or other means. Elizabethtown Water Company Consolidated now takes water from the Raritan and Millstone Rivers at their confluence, five miles below the site of the proposed reservoir. The company operates under a grant from the State of the right to divert 20,000,000 gallons of water a day from these rivers, although the capacity of the company's plant restricts usage to approximately 14,000,000 gallons a day. This was explained to the Attorney General, but he said this right in no way alters the rights of the Federal Government under the commerce clause of the Constitution.

In other words, if the canal be authorized, the sole right possessed by the State to utilize its own waters, directly or through agencies to which it delegates diversion privileges, will depend upon whatever agreement it may be able to effect with the Federal Government for joint development of these waters.

These are the "respects in which said canal might lessen or injure present and potential water supplies of the State."

STEPS THE COMMISSION ADVISES

The resolution of the Senate called upon our Commission for "a statement of steps the Commission advises, or has taken, to acquaint the authorities in Washington with the facts in its possession."

The steps which the Commission has taken have been outlined in the foregoing text and in Supplement A. Steps that the Commission advises

must necessarily encompass the potable and industrial water supply problem. Bearing in mind that the War Department Corps of Engineers plans to take an immense quantity of water for the Ship Canal, it seems to us that the State's policy respecting water supplies should be determined without further delay. Sources of subsequent water supply in the watershed of the Raritan River would be denied to the State. The same might be true of the watershed of the Delaware River, though that is not as obvious.

There should be a decision, at an early date, as to whether the Delaware or the Raritan watershed is to be tapped first. Whatever plan is arrived at, it should set forth the State's purposes respecting each of these watersheds, including their use for recreation.

NEW JERSEY'S WATER SUPPLY PROBLEM

The Commission considers it appropriate and essential at this time to bring to the attention of the Legislature certain important elements of the general water supply situation in New Jersey.

1. THE PRESENT SITUATION

Principal Water Consuming Areas. Considered from a water supply viewpoint, New Jersey is logically divided into four principal areas:

1. North Jersey Industrial Area, comprising the six northeasterly counties of Essex, Hudson, Passaic, Bergen, Union and Middlesex.
2. South Jersey Industrial Area, centering in Camden and Trenton.
3. Seashore Resort Area, along the Atlantic coast line.
4. Remainder of the State.

South Jersey, Seashore and Rural Areas. Of the four areas, the three latter, comprising 85 percent of the area of the State, have only about one-third of the population, which is, in general, widely distributed. These three areas have no water supply problem comparable to that of North

Jersey. Supplies in operation are adequate, with improvement or enlargement of local facilities, for a considerable expansion of industries. They are sufficient for apparent population growth.

Still there is an ever-present doubt in the minds of numerous municipal authorities as to whether the supply of underground water will be plentiful indefinitely. Wells are the main dependence for local supplies and for those of nearly all industrial centers. Whenever one municipality seeks the approval of the State Water Policy Commission for diversion of more water, neighboring municipalities show concern and often register objections. Engineering plans for a large water supply serving North Jersey, in two instances, were so drawn as to make it possible to deliver part of the water to South Jersey if, and when, it might be needed.

Looking to the future, it may be said there is no immediate problem in sight, but this section of the State offers so many inducements for industrial expansion and so much opportunity for popular playground extension, it would not be right to neglect the southern counties in the contemplation of water supply projects. Intrusion of salt water into the wells along the seashore has to be watched. United States Geological Survey and State Water Policy Commission, by means of experimental wells, are seeking to determine its probabilities.

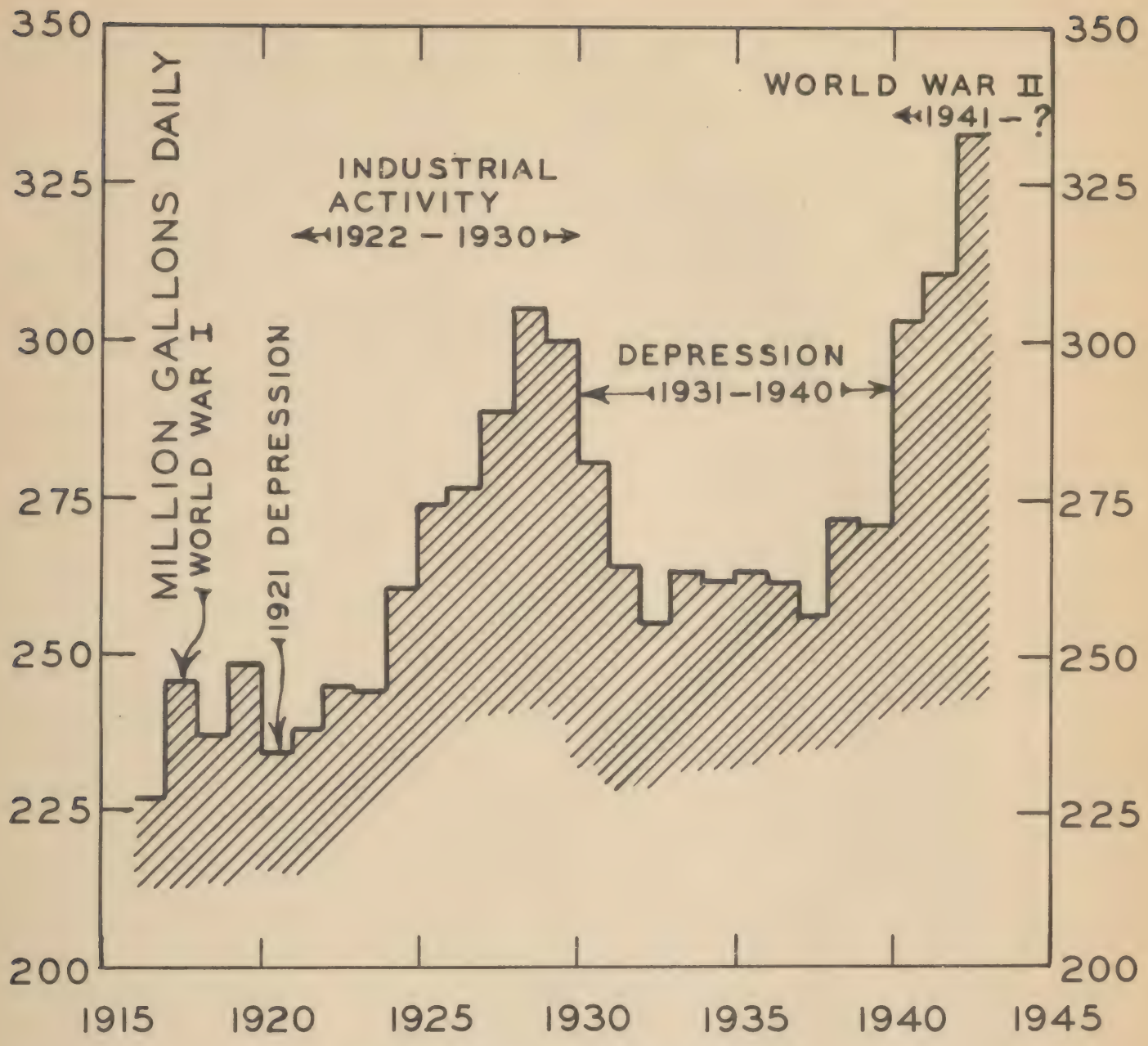
North Jersey Industrial District. About 2,750,000 people, two-thirds of the population of New Jersey, are crowded into the six northeasterly counties, which comprise only 15 percent of the area of the State. This area, because of the advantages of favorable transportation facilities and an adequate labor supply, is the seat of a great proportion of our industry and business. And, because the area has gradually

developed from a series of isolated communities to one densely populated community consisting of a great number of independent municipalities, water is supplied to the area by 33 separate water agencies. Other industrial areas in the country of similar size - Boston, New York, Philadelphia, San Francisco, Los Angeles - have a single, or at most two supplies, centrally controlled and supplying the principal city and its suburbs. It is within this area that the water supply problem demands solution.

Water Consumption in the Northern District. The record of the average daily use of water in the North Jersey Industrial District during the past twenty-five years, shows strikingly the effect of industrial activity on water consumption. A recent release by the Bureau of the Census states that the eight northeasterly counties of New Jersey have actually decreased in population since 1940 and the population increase in these counties between 1930 and 1940 was negligible. Yet we find that water consumption in the district was 300,000,000 gallons daily in 1930, 255,000,000 in 1933, and has averaged about 350,000,000 gallons daily during the past four months. The following diagram shows the average daily water consumption in the district for the period 1917 to 1943, and brings out clearly the effect of industrial activity on the rate of use of water.

II. INTERCONNECTIONS

Prior to this year, the major supplies of the State were only partially cross-connected. The passage by the Legislature in March 1942 of Chapter 24, P.L. 1942, authorizing the Commission to require interconnections between water supplies and the transfer of water through such interconnections, as a war measure, has made possible construction of



STATE OF NEW JERSEY

EFFECT OF INDUSTRIAL ACTIVITY ON WATER CONSUMPTION NORTH JERSEY INDUSTRIAL DISTRICT 1917-1943

STATE WATER POLICY COMMISSION

connections which have greatly improved conditions. These connections are permanent additions to the water systems of the State and will no doubt be used in time of need even after the war, although the power of the Commission to require transfers between systems expires one year after the signing of peace treaties with the enemy.

Interconnections in the Camden area now make it possible for each of the small separately operated systems in the towns surrounding Camden to be supplied by the Camden system in case their local system is inadequate, or is interrupted. Likewise, the major systems in North Jersey have been interconnected to the maximum extent, currently practicable.

These interconnections permit a potentially greater spread of water but, of course, they do not add a drop to the total quantity available.

III. PRESENT SUPPLIES FOR NORTHERN DISTRICT

As pointed out elsewhere herein, the North Jersey Industrial District is supplied with water from 33 different sources, each operated by a separate and independent agency, either public or corporate. The Commission's engineers have estimated that it is unsafe to count on obtaining more than an average of 325,000,000 gallons of potable water daily from these 33 supplies. Further, even with the interconnections between supplies as recently constructed, it is not practicable to make all of this quantity available to all parts of the District, so there is always the possibility of a local shortage due to unusual demand or breakdown in service, which cannot be supplied from the surplus of other supplies.

With consumption of water increasing daily, and now averaging about 350,000,000 gallons daily, it is evident that only a combination

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111. Public Utilities for Industrial Districts

As pointed out elsewhere herein, the North Jersey Industrial District is supplied with water from 78 different sources, each operated by a separate and independent agency, either public or corporate. The Commission's engineers have estimated that it is unsafe to count on obtaining more than an average of 258,000,000 gallons of potable water daily from these 78 supplies. Further, even with the interconnections between supplies as recently constructed, it is not practicable to make all of this quantity available to all parts of the District, so there is always the possibility of a local shortage due to unusual demand or breakdown in service, which cannot be supplied from the surplus of other sup-

[illegible] consumption of water increasing daily, and now averaging [illegible] gallons daily, it is evident that only a combination

of heavy rainfall, good management and freedom from accidents and sabotage can save the District from a water shortage in 1944. The Commission, using the powers granted by Chapter 24, Laws of 1942, will do everything possible to avoid such shortage. Construction of works to increase the available supplies is impracticable at this time due to restrictions on use of materials.

IV. FUTURE NEEDS FOR WATER IN THE NORTHERN DISTRICT

It is futile to attempt to determine exactly what the course of the water consumption curve will be after the war. It is notable that forward looking citizens 27 years ago, during World War I, promoted legislation leading to the construction of the Wanaque water project. There was ample water available in 1916 for all needs, and no data on which to conclude that demands would increase with unusual rapidity. Yet the Wanaque was completed in 1930, just in time to save the District from a water famine, and water consumption had increased 35 percent in twelve years, from 227,000,000 gallons per day in 1917, to 305,000,000 gallons per day in 1929.

Many students are convinced that World War II, like World War I, will be followed by a period of great industrial activity. If this occurs, New Jersey, due to its favorable location, will share in this activity. There is much discussion in Congress and the public press of the necessity for maintaining industrial production at a high level after the war, as a means of avoiding serious unemployment. Also, the deflation of our stock of civilian supplies, much more serious than after World War I, will in itself mean that the production scale must be maintained at a high level for several years to come.

We are disposed toward the outlook described by President Eric A. Johnston of the Chamber of Commerce of the United States in the current

Readers' Digest. "We're Not Washed Up" -- his conception of post-war prospects -- is worth reading. His warnings are particularly applicable to our water supply future.

ADVOCACY OF NEW WATER SUPPLIES

The authoritative and unbiased opinion, we believe, is on the side of a substantial and prompt enlargement of both potable and industrial supplies that service the industrial belt lying along the cross-State railroads to the Ports of Newark, Weehawken, Hoboken, Jersey City, Bayonne, Elizabeth, Perth Amboy and New York City. Summarized, that opinion has been expressed thus:

State Water Policy Commission and North Jersey District Water Supply Commission advocated a new supply in 1930, but were in conflict over reservoir sites. This brought about a stalemate.

Governors George S. Silzer, A. Harry Moore and Harold G. Hoffman advocated a new water supply in messages to the Legislature. Bills were introduced but not brought to vote.

Special Committee on Water Supply of the Legislature in 1940 spent six months studying the subject, held public hearings, agreed on legislation but never introduced it. The bills and report of that committee were presented in 1941 by the Speaker of the Assembly, Roscoe P. McClave. Again, the bills were not brought to vote.

New Jersey Section, American Water Works Association, comprising, as its report stated, "a membership of 210 engineers, superintendents, operators, and others whose occupations are concerned with water works and water supplies" advocated a new supply in a vigorous communication to Governor Moore and the Legislature, April 4, 1940. (See Supplement B at back of this report.)

The undersigned and witness opinion, we believe, is on the side of a substantial and prompt improvement of both potable and industrial supplies that service the industrial belt lying along the ocean-shore railroads to the Ports of Newark, Bayonne, Hoboken, Jersey City, Bayonne, Elizabeth, Perth Amboy and New York City. Summarized, that

Governor's Emergency Water Supply Commission. (March 2, 1942) Since it has been mistakenly asserted that the Emergency Water Supply Commission advised against a new water supply, attention is called to the opening paragraph of that commission's report, which reads:

> "1. The establishment of any new major water supplies would require time, planning, construction, and a very large expenditure of State funds. The consideration of such projects is not practical at this time on account of the exigencies of the situation with which we are confronted. The present emergency necessities of the State will be met by the adoption of the suggestions herein contained." The emergency commission proceeded to say that "considering the present and imminent demands for water in the State, there are sufficient supplies now available provided all of the presently developed supplies are immediately and completely utilized."

The declaration was carefully qualified to avoid responsibility for the unpredictable water requirements of rapidly expanding war industries. Consumption of water, at the time of the report, was below 300,000,000 gallons a day in the North Jersey industrial belt. Within 18 months the daily average consumption for a single month reached an all-time peak of 357,460,000 gallons. That was the record for August of this year. The average for September dropped to 340,200,000 gallons.

POLLUTION OF OUR WATER SUPPLIES

Several of our present water supplies are subject to possible pollution which may eventually result in public demand that they be abandoned as sources of potable water for domestic use.

Passaic and Elizabeth Rivers were abandoned as sources of potable water due to public pressure. Passaic River has been used since 1930 for an industrial supply for Paterson and Passaic, and it has been necessary to use its waters to a limited extent for potable purposes during the emergency of the past two years, with much resultant dissatisfaction, although the water, as delivered after filtering and treating with chlorine, is safe. The public cannot be asked to make use, in normal times, of a water supply which was abandoned 13 years ago as unsatisfactory (See Supplement C).

Rahway River presents the two-fold problem of flood control and pollution. There are 12 municipalities in Essex and Union Counties that are organized as a "joint meeting" for sewage disposal. The treated sewage and untreated storm drainage of these municipalities is taken into Rahway River by means of a trunk sewer. The situation has been a matter of contention, in and out of the courts, for several years. Current plans for enlarging the capacity of the sewer may obviate further flood nuisances, but they will not overcome objection to the river as a source of potable water supply for the City of Rahway.

Industrial wastes, sooner or later, will make the lower Raritan River unusable for potable water.

IMMEDIATE ACTION NECESSARY

There is much talk of developing a program of useful works to be constructed after the war as a means of providing employment. There is no other class of public works of such immediate and permanent value as water supplies, without which the State cannot hope to grow industrially

and prosper accordingly. Such works should be planned in detail, so that construction and employment can begin immediately after cessation of hostilities when the need may be great. This planning takes time and should be started at once.

Respectfully submitted,

FORSTER W. FREEMAN,

ERNEST J. HOWE,

THURLOW C. NELSON,

HERBERT K. SALMON,

GEORGE S. BURGESS, Chairman.

Attest:

John Wyack, Secretary.

SUPPLEMENT A

CORRESPONDENCE AND MEMORANDA

RESPECTING EFFECT OF SHIP CANAL ON WATER SUPPLIES

STATE OF NEW JERSEY

STATE WATER POLICY COMMISSION

STATEMENT TO CONGRESSIONAL COMMITTEE ON RIVERS AND HARBORS

In the matter of H. R. 1880, 78th Congress, First Session, A Bill authorizing the Construction of the New York Bay-Delaware River Section of the Atlantic Intracoastal Waterway and making appropriation therefor	Memorandum of the New Jersey State Water Policy Commission

To the Committee on Rivers and Harbors
House of Representatives
Washington, D.C.

The New Jersey State Water Policy Commission respectfully submits a brief memorandum stating its position on H. R. 1880, 78th Congress, First Session, as follows:

1. The bill refers to the construction of a canal across the State of New Jersey having a bottom width of 250 feet and a depth of 27 feet, from the vicinity of Bordentown, New Jersey, to the vicinity of Sayreville, New Jersey, in accordance with the report of the Chief of Engineers, U. S. Army, dated July 14, 1942. The Commission has been unable to obtain a copy of said report, although it has made an effort to do so from the Chief of Engineers, Washington, D.C., and the Division Engineer, New York, having been told that the report is confidential and cannot be consulted. This leaves the Commission in a position of not knowing definitely which project is under consideration. Therefore, general comments can only be made based upon certain assumptions.

2. The New Jersey State Water Policy Commission has authority over the sources of potable and public water supplies of the State to the end that they may be conserved and developed for the use of the people, industry and commerce.

The Commission allocates undeveloped sources of water supply to municipalities, commissions and water companies. This includes underground waters and surface streams. Allocation is made on basis of need, non-interference with other existing sources of supply, also keeping in mind the future needs of the municipalities in the territory under consideration.

Many valuable public water supplies have been developed and are in use in the vicinity of the proposed New Jersey Section of the Intracoastal Waterway, extending from Bordentown on the Delaware River to Sayreville on Raritan River.

3. A sea level canal between Bordentown and Sayreville would cause intrusion of salt water and contamination of many well fields used for potable and industrial water supply; also permanent injury to the artesian water-bearing sands which outcrop along the route of the canal.

The eventual intrusion of salt water throughout the length of the canal would also affect the Delaware River from which many cities, towns and industries take water.

4. A lock level canal would require a supply of fresh water for lockage, seepage, evaporation and other losses, the amount depending on the elevation of the summit level and the size of the locks and traffic to be handled. One of the reports (House Document 219, 73rd Congress, 2d Session) mentions 1,000 c.f.s. to be taken from Delaware River and Raritan River. In what proportion is not clear. It is suggested that the water rights of the Delaware and Raritan Canal in Delaware River be appropriated. Those rights are indefinite, but may be as much as 250 c.f.s. It is also assumed that 10 percent or 100 c.f.s. will be available from cross drainage intercepted by the proposed canal. That leaves 650 c.f.s. to be obtained from Raritan River. The Raritan River watershed cannot produce 650 c.f.s. even in an ordinary dry year, and in an extremely dry year the deficit would have to be taken from Delaware River.

5. Future potable and public water supplies for New Jersey will have to come from Raritan River and Delaware River watersheds. Storage reservoirs on the tributaries will be necessary to make available the amounts necessary to meet future needs.

Several official reports have been made involving the development of these waters. Special Report No. 3, South Branch Project, New Jersey State Water Policy Commission, 1931, contemplates taking a total of 152 million gallons of water daily from Black River and South Branch, tributaries of the Raritan River, and Musconetcong River, tributary of the Delaware River. Chimney Rock Project proposed by the North Jersey District Water Supply Commission, 1930, contemplates taking 145 million gallons of water daily from North Branch, Black River, South Branch, Rockaway Creek, Spruce Run and Middle Brook, tributaries of the Raritan River. Report on the Utilization of the Delaware and Raritan Canal for a metropolitan water supply in the State of New Jersey, by an engineering committee appointed by former Governor A. Harry Moore, 1938, proposes a water supply of 200 million gallons of water daily by the utilization of the water rights of the Delaware and Raritan Canal Company, now owned by the State of New Jersey, as a source of supply for New Jersey, including the northeastern metropolitan district as well as the Trenton-Camden area in the lower Delaware Valley.

6. Existing potable and public water supplies which may be affected by the construction of the canal include the following:

City of Perth Amboy well field in the vicinity of Old Bridge, N.J.- 10 million gallons daily capacity.

City of South Amboy well field - 1.5 million gallons daily capacity.

Borough of South River well field - 1.0 million gallons daily capacity.

Borough of Sayreville well field - diversion rights 2.0 million gallons daily (undeveloped).

Duhernal well field (Joint industrial supply for duPont, Hercules and National Lead companies in Parlin) wells located along South River between Old Bridge and Spotswood, N.J. - 15.0 million gallons daily capacity.

City of Bordentown well field on Crosswicks Creek near White Horse - 1.25 million gallons daily capacity.

Many other towns and cities southeast of the proposed canal route take their water supply from artesian sands which outcrop along the proposed canal route.

Ground-water investigations by the U.S. Geological Survey in cooperation with the New Jersey State Water Policy Commission, conducted in the vicinity of Parlin, N.J., point out the grave danger of salt water intrusion of certain sand beds outcropping in the Raritan Bay area and along South River, and particularly the exposing of these sand beds by dredging. Special Report No. 7, Water Supplies from the No. 1 Sand in the Vicinity of Parlin, issued by the New Jersey State Water Policy Commission in 1937, together with subsequent investigations, clearly indicate the existence of salt water intrusion in several wells taking water from the No. 1 sand which has been exposed by dredging in Raritan River and the Washington Canal in South River valley.

7. The possible effect of the canal proposed in H. R. 1880 will depend upon the project contemplated therein. If a sea level canal is constructed, the result on the ground water supplies would be permanent injury of the wells in the Parlin-Old Bridge-Spotswood area. If the canal is to be of a lock type, the effect upon the well fields in this area would depend upon the summit level and the exact location.

8. Another possible effect on the water supplies of the State is dependent upon what provision is made for taking care of the natural flow of the streams which are intercepted by the canal across the State, particularly the Millstone River and Assunpink Creek. The former is used for potable and industrial water supplies in many places, particularly in the Bound Brook area, while the latter stream is used extensively for industrial water supply in the Trenton area.

9. The New Jersey State Water Policy Commission, for the above reasons and others which may be more apparent when the details of the project are fully disclosed, is apprehensive as to the effect of the construction of the proposed canal on existing public, potable and industrial water supplies which are vital to the health, safety and welfare of a large portion of the State, and also the effect the taking of water supply from the Raritan and Delaware watersheds for the operation of the canal will have upon the future needs of the State of New Jersey for water supply which of necessity must come from the Raritan River and Delaware River watersheds.

The Commission respectfully requests permission to file a more detailed memorandum with the Committee in order that its position as a result of the hearing before your Honorable Committee on March 9 may be more completely and fully presented.

NEW JERSEY STATE WATER POLICY COMMISSION

By (Signed) H. T. Critchlow

Engineer in Charge

Trenton, N.J.
March 8, 1943

STATE OF NEW JERSEY

STATE WATER POLICY COMMISSION

May 14, 1943

Major-General E. Reybold,
The Chief of Engineers,
United States Army,
War Department,
Washington, D.C.

Dear Sir:

In the course of your conference in Washington, May 4, 1943, with our Engineer in Charge, Howard T. Critchlow, and others, I am informed that you requested a memorandum of the engineering data as presented at the conference. Therefore, the enclosed statement by Mr. Critchlow is forwarded with the hope that the Federal authorities will give it due consideration.

The State Water Policy Commission of New Jersey is the agency of the State charged with responsibility for conservation of water resources. While numerous efforts to develop the water resources of the Raritan and Delaware River Basins have been made without success, nevertheless these resources remain vital to the growth and development of our State.

Our commission feels that existing water supplies already developed in the area of the proposed ship canal, as well as the potential resources cited, would be impaired by its construction.

We trust that no action will be taken at this time which may prove detrimental to either the developed or the undeveloped potable water resources of our State.

Respectfully yours,

(Signed) George S. Burgess,

Chairman.

STATE OF NEW JERSEY

STATE WATER POLICY COMMISSION

May 14, 1943

Major General E. Reybold,
The Chief of Engineers,
United States Army,
War Department,
Washington, D.C.

Dear Sir:

In compliance with your request, I submit herewith a memorandum respecting the proposed New York Bay-Delaware River Section of the Atlantic Intracoastal Waterway, as outlined to you at a conference in your office on May 4, 1943.

Authority of Commission

The Commission is the State agency which has authority over the sources of potable and public water supplies of the State to the end that they may be conserved and developed for the use of the people, industry and commerce. It allocates undeveloped sources of water supply, upon application, to municipalities, commissions and water companies, both underground waters and surface streams. Allocation is made on the basis of need and non-interference with other existing sources of supply; also keeping in mind the future needs of the municipalities in the territory under consideration.

Present Water Situation

Many valuable water supplies have been developed and are in use in the vicinity of the proposed canal, extending from Sayreville on the Raritan River to Bordentown on the Delaware River. These are mostly from underground sources and include the following:

City of Perth Amboy well field in the vicinity of Old Bridge - 10 million gallons daily capacity.

City of South Amboy well field - 1.5 million gallons daily capacity.

Borough of South River well field - 1.0 million gallons daily capacity.

Borough of Sayreville well field - diversion rights 2.0 million gallons daily (undeveloped).

Duhernal well field (joint industrial supply for duPont, Hercules and National Lead companies in Parlin) wells located along South River between Old Bridge and Spotswood - 15.0 million gallons daily capacity.

City of Bordentown well field on Crosswicks Creek near White Horse - 1.25 million gallons daily capacity.

May 14, 1958

Honorable Howard E. Campbell
Chief of Engineers
United States Army
Washington, D.C.

Dear Sir:

In compliance with your request, I submit herewith a memorandum supporting the proposed New York-Delaware River Section of the Atlantic Intracoastal Waterway, authorized to you at a conference in your office on May 4, 1958.

Authority of Commission

The Commission is the State agency which has authority over the sources of potential public water supplies of the State to the ordinance and commerce. It allocates these natural sources of water supply, appropriation, to municipalities, industries, farms and other consumers, both of need and per-interference with other sources of supply, also keeping in mind the future needs of the municipalities in the territory under consideration.

Present Water Supplies

Many valuable water supplies have been developed and are in use in the vicinity of the proposed canal, extending from Swedesville on the

10 million gallons daily capacity.

City of South Amboy well field - 1.5 million gallons daily capacity.

Borough of South River well #1 - 1.0 million gallons daily capacity.

Industrial well field (joint industrial supply for Dupont, Ethyl and National Lead companies in Perth) well in Deep Creek, South River, between Old Bridge and Spotswood - 15.0 million gallons daily capacity.

City of Perth Amboy well field on Crossroads Creek near White Horse - 1.25 million gallons daily capacity.

Many other towns and cities along the Atlantic coast between Asbury Park and Point Pleasant southeast of the proposed canal route take their water supply from artesian sands which outcrop along the proposed canal route.

The northeastern metropolitan district across the Hudson River from New York City and extending south to and including the lower Raritan River basin from Somerville to Sayreville and Perth Amboy has a population of over 3,000,000 and is one of the most important industrial areas on the eastern seaboard. The total water consumption in this area is now about 329,000,000 gallons daily, having increased rapidly from 270,000,000 gallons daily in 1940 before our entrance into the war. About 84 percent of the water is obtained from surface streams, upon which have been constructed large storage reservoirs, and 16 percent from wells. The safe yield of all sources in an extreme dry year is conservatively estimated to be from 305 million gallons daily to 340 million gallons daily, the former limit assuming a 25 percent reserve storage remaining in the larger reservoirs and the latter limit with all storage utilized.

A program of interconnections between the important systems is being completed by the Commission under emergency legislation passed in March, 1942 (Chapter 24, Laws of 1942). This is to assure, so far as possible during the war emergency, an uninterrupted supply of water to war industries. Since, for the duration, it will be impossible to develop additional sources of water supply, it is vital that the existing sources be utilized to the fullest extent.

Future Water Developments

Future water supplies for the northeastern metropolitan district of New Jersey will have to come from storage reservoirs in the Raritan River basin, the last large intra-state stream which has not been developed, or from tributaries of the Delaware River. Several official reports have been made involving the development of these waters. Special Report No. 3, South Branch Project, proposed by this Commission in 1931, contemplates taking a total of 152 million gallons daily from Black River and South Branch, tributaries of the Raritan River, and Musconetcong River, a tributary of Delaware River. Chimney Rock Project, proposed by the North Jersey District Water Supply Commission in 1930, would take 145 million gallons daily from North Branch, Black River, South Branch, Rockaway Creek, Spruce Run and Middle Brook, all tributaries of the upper Raritan River. Other projects have been studied, but all point to the necessity of utilizing the headwaters of Raritan River basin. There is attached to this memorandum a map showing these water supply areas which are necessary for the northern metropolitan district and their relation to the water supply for the proposed canal from the Raritan River, as developed by storage in the Somerville reservoir.

Water Supply for Ship Canal

Examination of testimony taken at the hearings before the Rivers and Harbors Committee of the House held March 9, 1943, a study of published reports on this project, particularly House Document 219, 73d Congress, 2d Session, Committee on Rivers and Harbors, House Document 93, 74th Congress, 2d Session, and also an examination of unpublished

reports in the New York District U.S.Engineer Office, (the latter by permission of the War Department) indicates the taking of dangerously large quantities of water from the Raritan River appears to be necessary for the operation of the proposed canal, thus creating a serious conflict in the use of water from the Raritan River basin for navigation and for potable and industrial water supply.

It is noted that an earlier plan for a sea level canal between Raritan Bay and Delaware River has been abandoned as it would have destroyed many valuable well fields used for water supply in New Jersey and also allowed salt water from Raritan Bay to traverse the canal to Delaware River and cause salinity invasion of that stream from Trenton to Delaware Bay, thereby interfering with the water supplies of many cities and industries.

A lock canal with a summit level of 10 feet above mean low water, with locks at Sayreville on the Raritan River and in Crosswicks Creek near Bordentown on the Delaware River, would require large quantities of water. In House Document 93 (1936), a report was made of the water supply needs, concluding that approximately 1,000 second-feet would be required. In order to protect the lower Delaware River, it was assumed that only 200 second-feet would be taken from that stream by pumping into the basin above the Bordentown locks for lockage purposes and thereby prevent any flow from the Raritan River through the canal to Delaware River. This would leave at least 800 second-feet to be obtained from the Raritan River.

The same report makes use of the U.S.Geological Survey records of flow between 1922 and 1932, assuming a storage reservoir on the North Branch of Raritan River at North Branch Village, having a capacity of 130,000 acre-feet, and shows

> ".....that the water requirements for the prospective traffic far exceeds the water supply available. Approximately 1,000 second-feet is required at all times at Sayreville, whereas the natural runoff of the Raritan basin, regulated by the proposed reservoir, would amount to a dependable flow of less than 700 second-feet". (Id. page 84)

This statement refers to the water supply for a ship canal having a bottom width of 250 feet and depth of 27 feet, locks 90 feet wide and 880 feet long.

A report (1941) by the New York District Engineer reviewed all prior reports and considered the advisability of constructing a waterway of lesser dimensions than those considered in House Documents 219 and 93 referred to above. This report considered a barge canal 170 feet wide, 14 feet deep, with locks 75 feet wide, 600 feet long. Water supply requirements at Sayreville were as follows: evaporation, 50 second-feet; leakage, 30 second-feet; seepage, 10 second-feet; lockage, 80 second-feet; flushing and scavenging, 585 second-feet; total 755 second-feet. At Bordentown there would only be sufficient water taken from the Delaware River for lockage purposes. In order to obtain the necessary water supply from the Raritan River, a storage reservoir is proposed on the river immediately below the junction of the north and south branches,

approximately four miles above Somerville and 22.5 miles above Sayreville. The report states that the drainage area at the proposed reservoir would be 468 square miles, which is reduced to a net area of 321 square miles because of a proposed water supply project of the State of New Jersey which would divert 85 percent of the flow for water supply use. The minimum low water flow of 60 second-feet would be maintained below the storage reservoir at all times. This reservoir would have a storage capacity of 218,000 acre-feet.

A report (1942) by the Chief of Engineers reviewed the barge canal project but recommended in lieu thereof the construction of a ship canal on the same route as for the barge canal.

No report appears to have been made on the water supply needs of the ship canal now proposed, taking into account the proposed diversion for water supply by the State of New Jersey and the evaporation loss from the storage reservoir, which would have a water surface area of 17 square miles. The plans for the canal contemplate intercepting 24 percent of the drainage area of the Millstone River, which lies southeast of the canal location, and provides for passing only the low water flow of the various streams below the canal crossings. While the flow from this area would reach Sayreville and be available for canal use, it would deprive the lower Millstone River of the normal and flood flows from a drainage area of 67.5 square miles and allow only the low water flow from the intercepted area to continue its natural course. This would interfere with riparian owners along the Millstone River and also with certain municipalities which use the stream for disposal of domestic sewage after treatment and public water supplies taken from the stream.

A careful analysis of the water supply needs of the canal and the capacity of the Raritan River basin to meet those needs has been made, based upon the above plans and the records of stream flow, for the period from 1922 to 1942. The ship canal would require more water than the barge canal by at least the additional amount of water necessary for lockage purposes in the larger locks. Barge canal lockage required 80 second-feet; ship canal lockage required 200 second-feet, or an additional 120 second-feet. Adding this to the requirement for the barge canal of 755 second-feet makes a total of 875 second-feet.

The accompanying Table 1 (omitted from this supplement) shows the net flow available at the Somerville dam and the Sayreville dam after deducting the water diverted for potable water supply and evaporation loss from the storage reservoir, and the regulation of the Somerville reservoir in order to maintain a regulated flow at Sayreville of 800 second-feet. It will be noted that in November and December, 1930; January, November, December, 1931; August, September, October, 1932 and January, 1940, such a flow cannot be maintained. The regulated flow would be reduced to a minimum of 141 second-feet in September, 1932. Further study of the records disclosed that a dependable supply of only 700 second-feet could have been maintained for the period 1922-1942 with the proposed storage reservoir. Another serious condition is created in the Raritan River below the Somerville storage reservoir to the junction of the Millstone River, a distance of eight miles. The flow would be reduced to a minimum of 60 second-feet, discharged through the sluice gates

at the foot of the dam, for the following periods: 1929, 1 month; 1931, 4 months; 1932, 6 months; 1933, 2 months; 1934, 2 months; 1935, 1 month; 1936, 1 month; 1937, 4 months; 1940, 3 months; 1941, 1 month; 1942, 2 months. In other words, when water is being stored in the reservoir after a depletion period, only the low flow of 60 second-feet will be passed down-stream.

Summary

I, therefore, agree with the previous findings of the War Department that there is not sufficient water in the Raritan River to operate the proposed ship canal in such a manner as to keep salt water out of the summit level of the canal and, therefore, must go on record as opposed to the construction of the proposed canal because it will encroach upon the future needs for potable and public water supply of the northeastern metropolitan district of New Jersey.

If more water is to be taken from the Delaware River for canal use in order to supplement the water supply which can safely be taken from the Raritan River basin without interfering with New Jersey's future potable water supply, it will be necessary to provide storage on the headwaters of the Delaware River. This would make it possible to increase the low flow of the Delaware River and reduce the danger of salt water intrusion up the river from Delaware Bay. In the Delaware River Diversion Case (283 U.S. 336, 805), the U.S. Supreme Court required the City of New York to release impounded water from storage when the flow at Trenton falls below 3,400 second-feet, a rate of flow which is 2,000 second-feet above the low flow of the river at that point. In other words, the principle was laid down by the Supreme Court that no complete diversion from the Delaware River should be made when the flow at Trenton falls below 3,400 second-feet. The court found that a flow of this amount was necessary to prevent substantial damage in the lower river.

Respectfully submitted,

(Signed) H.T.Critchlow

Engineer in Charge.

WAR DEPARTMENT

OFFICE OF THE CHIEF OF ENGINEERS

WASHINGTON

May 25, 1943

Mr. George S. Burgess,
Chairman, State Water Policy Commission,
State of New Jersey,
19 Washington Street,
East Orange, New Jersey

Dear Sir:

Receipt is acknowledged of your letter of May 14, 1943, in which you refer to the conference of May 4, 1943, with Mr. Howard T. Critchlow and others relative to the proposed ship canal across the State of New Jersey. You inclose with your letter a memorandum of the engineering data as presented at the conference and ask that no action be taken at this time which may prove detrimental to either the developed or undeveloped potable water resources of the State of New Jersey.

You may be assured that the Department is cognizant of the importance of conserving the existing and potential water supplies of the State of New Jersey and that every consideration will be given to the views of the State Water Policy Commission on this matter in connection with any further Departmental action relative to the contemplated Cross-Jersey Canal.

If available, it will be appreciated if you will furnish this office four additional copies of Mr. Critchlow's memorandum report.

For the Chief of Engineers:

Very respectfully,

(Signed) Geo. R. Goethals,

Colonel, Corps of Engineers,
Chief; River and Harbor -
Flood Control Branch,
Construction Division.

STATE OF NEW JERSEY

STATE WATER POLICY COMMISSION

August 19, 1943

Major General Eugene E. Reybold,
Chief of Engineers, United States Army,
New War Department Building,
Washington, D.C.

Dear General Reybold:

The Senate of the State of New Jersey on Thursday last passed the enclosed resolution instructing the State Water Policy Commission to report the extent to which the projected New Jersey Ship Canal might lessen or injure our present or potential water supplies.

Before the Commission may consider the subject intelligently, it would seem that we ought to have more definite information than available from conferences and hearings which have been held in Washington. In addition to these, the engineer of our Commission and others have reported informal discussions with representatives of your office.

We understand the question has been referred back to you by the Congress for restudy with respect to the effect of the canal on the potable water supplies of New Jersey. Will you be good enough, therefore, to let us know your present purposes in respect to the planning of the canal?

We will be glad to furnish you with such information as you may desire concerning present and proposed water developments which may be affected by the canal. If you care to have us do so, we will discuss our report with you before it is presented to the Senate.

Very truly yours,

(Signed) George S. Burgess

Chairman.

WAR DEPARTMENT

OFFICE OF THE CHIEF OF ENGINEERS

WASHINGTON

2 September 1943

Mr. George S. Burgess, Chairman,
State Water Policy Commission,
19 Washington Street,
East Orange, New Jersey

Dear Mr. Burgess:

Reference is made to your letter of 19 August 1943 relative to the contemplated Cross Jersey Canal. You ask for additional information including advice as to the present purposes of this office in regard to the planning of the canal for use in connection with the resolution of the Senate of the State of New Jersey instructing the Commission to report the extent to which the projected canal might lessen or injure the State's present or potential water supplies. You offer to furnish the Department such information as may be desired concerning present and proposed water developments which may be affected by the canal and to discuss your report to the Senate before it is presented to that body.

By resolution adopted 25 June 1943 the Committee on Rivers and Harbors, House of Representatives, requested a review of the reports on the New York Bay - Delaware River Section of the Intracoastal Waterway submitted 11 August 1942 and previous reports with a view to determining whether any change in the plans for the water supply is advisable at this time. The field study in response thereto has been assigned to Brigadier General B. C. Dunn, the Division Engineer at New York City, with Colonel A. B. Jones, the District Engineer, New York City, to be in immediate charge. Upon receipt of the field report in this office it will be referred to the Board of Engineers for Rivers and Harbors for required review prior to its transmission to Congress with the recommendations of the Department.

Your interest and courtesy in this matter are appreciated. As stated in letter of this office dated 25 May 1943, the Department is cognizant of the importance of conserving the existing and potential water supplies of the State of New Jersey and you may be assured that full consideration will be given in the current reexamination to your views and those contained in Mr. Critchlow's engineering report of 14 May 1943.

WAR DEPARTMENT

OFFICE OF THE CHIEF OF ENGINEERS

WASHINGTON

2 September 1943

Mr. [illegible], Chairman
State Water Policy Commission,
[illegible],
[illegible], New Jersey

Dear Mr. [illegible]:

Reference is made to your letter of 19 August 1943 relative to the comments [illegible] in regard to [illegible] in connection with [illegible] the Commission [illegible] the projected canal [illegible] be [illegible] considered [illegible] developments which may [illegible] your report [illegible] the [illegible] before [illegible] is presented to that body.

By resolution adopted 25 June 1943 the Committee on Rivers and Harbors, [illegible], requested a review of the reports on the [illegible] with a view to [illegible] whether [illegible] the water supply is adequate at this time. [illegible] has been [illegible] Division Engineer [illegible] New York, [illegible] District Engineer, New York, [illegible] in [illegible] of the reports.

Your interest and courtesy in this matter are appreciated. As stated [illegible] the Department [illegible] you may be assured that [illegible] will [illegible] Mr. Critchlow's engineering report of [illegible].

In its waterway studies the Department is always anxious to cooperate to the fullest extent with State authorities and to develop plans satisfactory to them, General Dunn and Colonel Jones have been requested to consult freely with the Commission and you may expect to hear from them just as soon as the field study getsactively underway. Further, they will be pleased to afford your staff full access to all available Department reports and data relative to the projected canal subject only to current security regulations.

The field report as mentioned above will be reviewed by the Board of Engineers for Rivers and Harbors. Brigadier General John J. Kingman, Senior Member of the Board, has kept in close touch with the water supply problems of the canal and he will be glad to discuss the matter with you or the members of your commission if you so desire. It is suggested that you might make arrangements for such a discussion by writing direct to General Kingman, Board of Engineers for Rivers and Harbors, 2 New York Avenue, N.W., Washington, D.C.

For the Chief of Engineers:

Very respectfully,

(Signed) Geo. R. Goethals,

Colonel, Corps of Engineers,
Chief; River & Harbor-Flood Control
Branch, Construction Division.

WAR DEPARTMENT

United States Engineer Office

New York District

Room 601, 120 Wall Street, New York, (5), N. Y.

13 September 1943

Mr. George S. Burgess, Chairman,
State Water Policy Commission,
19 Washington Street,
East Orange, New Jersey

Dear Sir:

This office has been furnished a copy of your letter of 19 August 1943 addressed to the Chief of Engineers, U. S. Army, and the reply thereto, relative to the pending report by your Commission on the effect of the proposed New Jersey Ship Canal upon your water supplies. Copy of a memorandum dated 14 May 1943 to the Chief of Engineers, U.S. Army by your Engineer in Charge on the water supply problem has also been received.

Studies of the water supply for the operation of the proposed canal are now being conducted by this office. It is endeavored to provide sources of supply which will cause a minimum of interference with the existing and proposed water supplies of the State of New Jersey, and also to make every reasonable effort to develop plans satisfactory to your Commission. Reservoir sites on the Raritan River immediately below the junction of the north and south branches, as well as on the west branch of the Delaware River near Cannonsville, New York are under consideration as possible sources from which water for the operation of the canal may be drawn. It does not appear that these sites will conflict with your present or potential water supplies as outlined by your Engineer in Charge in the memorandum of 14 May 1943 to the Chief of Engineers.

Further discussion of the matter is evidently very desirable. It would therefore be appreciated if you would instruct your engineer to visit this office at any convenient time to comment upon the proposed reservoir sites.

Very truly yours,

(Signed) A.B.Jones,

Colonel, Corps of Engineers,
District Engineer.

WAR DEPARTMENT

United States Engineer Office

Room 601, 120 Hall Street, New York, (3), N. Y.

12 September 1945

Mr. George S. Burgess, Chairman,
State Water Policy Commission,
[illegible] State Street,
Trenton, New Jersey

Dear Sir:

This office has been furnished a copy of your letter of 29 August 1945 addressed to the District Engineer, U. S. Army, and the reply thereto, relative to the pending report by your Commission on the effect of the proposed New Jersey Canal upon your water supplies. Copy of a memorandum dated 14 May 1945 to the Chief of Engineers, U.S. Army by your Engineer in Charge on the water supply problem has also been received.

Studies of the water supply for the operation of the proposed canal are now being conducted by this office. It is envisioned to provide sources of supply which will cause a minimum of interference with the axis line and proposed water supplies of the State of New Jersey, and also to make every reasonable effort to develop plans satisfactory to your Commission. Reservoir sites on the Raritan River immediately below the junction of the North and South branches, as well as on the west branch of the Delaware River near Cannonsville, New York are under consideration as possible sources from which water for the operation of the canal may be drawn. It does not appear that these sites will conflict with your present or potential water supplies as outlined by your Engineer in Charge in the memorandum of 14 May 1945 to the Chief of Engineers.

Further discussion of the matter is evidently very desirable. [illegible] would be very glad to [illegible] at any convenient time to comment upon the proposed reservoir sites.

(Signed) A. B. Jones

Colonel, Corps of Engineers,
District Engineer.

SUPPLEMENT B

STATEMENT OF

AMERICAN WATER WORKS ASSOCIATION, NEW JERSEY SECTION

ON NEED FOR ADDITIONAL WATER SUPPLY

AMERICAN WATER WORKS ASSOCIATION
New Jersey Section

April 4, 1940

Governor A. Harry Moore
and
Special Legislative Committee on Water Supply,
State House,
Trenton, New Jersey

Honorable Sirs:

At a meeting of the Board of Trustees of the New Jersey Section of the American Water Works Association - which section has a membership of 210 engineers, superintendents, operators, and others whose occupations are concerned with water works and water supplies - because of a deep conviction that prompt action should be taken in the interests of public safety and public health to insure an increase in the sum total amount of potable water available for distribution in the State of New Jersey, it was directed that the following statement be sent to you:-

It has been successfully demonstrated many times in the past that droughts in water supplies occur not so much because of high average rates of water consumption, but rather because of peak rates of consumption during hot weather, at times coincident with low run-off and small ground water storage. This combination of circumstances occurred in the year 1939 to a degree somewhat in excess of some of the recent dry periods but not in excess of other droughts that have occurred in the past.

Specifically, one of the first municipalities in 1939 to realize a shortage of water was the Borough of Lodi. In this instance, existing wells gave evidence early last summer of being incapable of producing sufficient water to meet the needs of the consumers. As a result it became necessary to purchase water from the Passaic Valley Water Commission for a period of several months.

The next and perhaps most spectacular shortage occurred in the Borough of Haledon. In this instance the impounding reservoir was drawn down below the normal intake pipes during the month of October and it became necessary to utilize the lower intake pipes, thus delivering to the filters a water which is difficult to treat. Furthermore, the municipality became so alarmed at the lack of capacity that it was forced to order all of the silk mills within the Borough to cease using municipal water for industrial purposes. This caused a shutdown in the main industrial occupation of the inhabitants of the town and resulted eventually in a contract between the Borough of Haledon and the Passaic Valley Water Commission, under which a pipe line of about 3000 feet in length was laid to connect the main arteries of the two systems. When this was completed, it became possible to supply sufficient water to meet some of the immediate demands of the manufacturers.

The City of Garfield, in the latter part of 1939, was forced to place in operation two old well fields that had been previously discontinued and had been considered virtually obsolete. Even under these extreme conditions, the City was not assured of an adequate supply and it became necessary to negotiate with the Passaic Valley Water Commission for an additional supply through a fortunately existing connection.

In the latter part of 1939 and the early part of 1940 the Borough of Wallington was notified by its Water Superintendent that the pumps in the wells were in danger of drawing air because of the lack of sufficient water in the wells.

In June, 1939, the reservoir of the Commonwealth Water Company in West Orange was being depleted faster than the supply lines could deliver water and as a result some of the consumers on the high level were temporarily without water. The emergency was met by opening a standby connection with the Town of Montclair, which had previously been ordered removed but which fortunately had been left in place.

From the middle of January, 1940, the City of Orange had a meager two weeks' supply of water left in its main storage reservoir. It is true that the bulk of the supply for the City for several months had been drawn from wells, but the final depletion of this reservoir would have required drastic measures in order to conserve the balance of the supply. As it was, the City was forced to order the Edison Company to discontinue use of water from the city mains. The company fortunately had a connection to another supply and was able to obtain sufficient water for its own needs.

During this period, the Buckhorn Springs Water Company at Belvidere averaged a depth of water of twelve inches in their reservoir, during which time water was pumped from wells of the abandoned Sunbury Converting Company located along the banks of the Delaware River.

In the early part of 1940 the Boonton reservoir of Jersey City reached an all-time record low and had it not been for the opportune arrival of rain in the middle of January and again in the middle of February, the City probably would have had to take extreme measures to curtail water usage. As it was, the condition of the reservoir caused serious concern and many advertisements appeared in the newspapers advising consumers to be cautious in the use of water. It should be pointed out that a few degrees difference in temperature in January and February might have caused snow storms instead of rain, in which case it is quite possible that the reservoirs could have been drawn down to an alarming extent. It is not impossible to believe that under those circumstances Jersey City might have had to resort to the most extreme methods in order to continue supplying its consumers with water.

These are the most noteworthy examples of the effect of the drought of 1939. Other supplies were affected but to a lesser degree. However, it is safe to say that had the period of dry weather continued as long as the driest period on record, more supplies would have experienced difficulty and the shortage in some of the above mentioned municipalities would have been extremely acute.

The City of [illegible], in the latter part of 1939, was forced to place in operation two old well fields that had been previously discontinued as they had been considered virtually obsolete. Even under these emergency operations, the City was not assured of an adequate supply and it became necessary to negotiate with the Passaic Valley Water Commission for an additional supply through a fortunately existing connection.

In the latter part of 1939 and the early part of 1940 the Borough of [illegible] was notified by its Water Superintendent that the pumps on the public wells were in danger of drawing air because of the lack of sufficient water in the wells.

In June, 1939, the reservoir of the Commonwealth Water Company in Short Hills was being depleted faster than the supply lines could deliver water and as a result some of the consumers on the high level were temporarily without water. The emergency was met by opening a standby connection with the Town of [illegible], which had previously been [illegible] but which fortunately had been left in place.

From the middle of January, 1940, the City of [illegible] had a [illegible] two weeks' supply of water left in its main storage reservoir. It so happens that the bulk of the supply for the City for several months had been drawn from wells, but the [illegible] depletion of this reservoir would have required drastic measures in order to conserve the balance of the supply. As it was, the City was forced to order the [illegible] Company to discontinue use of water from the city mains. The company fortunately had a connection to another supply and was able to obtain sufficient water for its own use.

During this period, the [illegible] Company [illegible] a depth of water of twelve feet in [illegible] reservoir, [illegible] which the water was pumped from wells of the [illegible] Company located along the banks of the [illegible] River.

In the early part of 1940 the Boonton reservoir of Jersey City reached an all-time record low and it was feared that the operations would have to be [illegible]. In the middle of January the water in the middle of February, the City authorities would have had to take drastic measures to curtail water use. As it was, the condition of the reservoirs caused serious concern and [illegible] were [illegible] in the newspapers [illegible] to be conserved in the use of water. It should be pointed out that a dry [illegible] temperature in January and February might have caused [illegible], in which case it is quite likely that the reservoirs would have been drawn down to an alarming extent. It is not improbable to believe that under these circumstances Jersey City might have had to resort to the most drastic methods in order to maintain supplying the [illegible] with water.

These are the most noteworthy examples of the effect of the drought of 1939, where supplies were affected during the latter months. However, it is safe to say that had the period of dry weather continued as long as the longest period on record, more supplies would have experienced [illegible] the shortage, [illegible] some of the [illegible] mentioned [illegible] would have been seriously [illegible].

The Board of Trustees of the New Jersey Section of the American Water Works Association is confident that the foregoing information, when considered in conjunction with other facts in your possession, clearly demonstrates the need for action at this time.

Respectfully submitted,

By Order of the Board of Trustees
NEW JERSEY SECTION, AMERICAN WATER WORKS ASSN.

(Signed) C. B. Tygert

Secretary

SUPPLEMENT C

PASSAIC RIVER AS A SOURCE OF WATER SUPPLY

PASSAIC RIVER AS A SOURCE OF WATER SUPPLY

The opinion of the City of Paterson as to the potability of the Passaic River supply was forcefully expressed to the State Water Policy Commission at a public hearing May 20, 1942, after the Commission had ordered Passaic Valley Water Commission to substitute 25,000,000 gallons of Passaic River water daily for the water it was then getting from Wanaque. The order was for the emergency period only. However, Paterson's Corporation Counsel, John F. Evans, objected strenuously to this action. The case against potable water supplies derived from unclean sources, even after treatment, was so clearly put by him, his plain-spoken view is here reproduced:

"Mr. Evans: The citizens of our community today are taking inferior water (Passaic River water) that is very objectionable to them. Although we own 38% here of this superior water supply (Wanaque), nevertheless, we cannot get it and we are forced to take the inferior water due to orders made by this commission. Something is simply haywire on that. They just don't fit together, these factors. Here is an investment of $11,000,000 Passaic Valley has in this Wanaque Reservoir, equivalent to 38%. They are shut off and have to resort to an inferior water supply, which by the way they own too.

"Chairman Burgess: Just a minute. You say this is inferior water?

"Mr. Evans: Inferior water - yes.

"Chairman Burgess: Is it injuriously so?

"Mr. Evans: It is very objectionable in taste and people do not like it and I do not think it is any answer to them to tell them, well, it won't poison you.

"Chairman Burgess: It is our understanding that the State Department of Health has approved that supply as a potable water supply. (In a letter to the Chairman, the State Department of Health subsequently disavowed responsibioity for the potability of the supply.)

"Mr. Evans: Maybe, because it won't poison them, but it certainly is inferior water in quality and taste, and even in use.

"Chairman Burgess: Do you consider it dangerous for the people to drink it?

"Mr. Evans: No, I do not consider it dangerous, but I could take a pail of swill and disinfect that and drink that without injurious consequences to me, but that would not make it proper water for people to drink."

The State Water Policy Commission concurs in the opinion of the eminent corporation counsel of Paterson.

PASSAIC RIVER AS A [illegible] SUPPLY

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"Chairman Burgess: Just a minute. You say this is inferior water?

"Mr. Evans: [illegible]

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The State Water Policy Commission concurs in the opinion of the eminent corporation counsel of Paterson.

Months later Passaic Valley Water Commission entered suit, charging pollution, against McEwan Brothers Paper Mills, Manhattan Rubber Company and Whippany Paper Board Company on Whippany River; Pequannock Valley Paper Company and Pequannock Rubber Company on Pequannock River. These rivers unite with Passaic River above the Passaic Valley Water Commission intake at Little Falls. Others named in suits were Caldwell-Wright Airport, Inc., and O'Dowd's Dairy on the Passaic River. State Department of Health joined in the suits -- not yet decided -- "to eliminate pollution on the Passaic River."

SUPPLEMENT D

VIEWS AND RECOMMENDATIONS

ON DISPOSITION OF

DELAWARE AND RARITAN CANAL

STATE OF NEW JERSEY

STATE WATER POLICY COMMISSION S-20

VIEWS AND RECOMMENDATIONS ON DISPOSITION OF DELAWARE AND RARITAN CANAL

Adopted at Meeting September 20, 1943

The State Water Policy Commission, because of a proposal in 1939 to use the Delaware and Raritan Canal as a source of potable water supply, and because its use for either a potable or an industrial supply of water will necessarily precipitate another court contest over rights in the Delaware River, has been giving a great deal of attention to the position of the Canal in relation to a new major water supply, whether it originates in the Delaware or the headwaters of the Raritan Rivers.

Our views on the presently projected use of the canal have been formulated with the deliberation that might be expected in such circumstances. Our convictions are that:

(1) We already have too many decentralized public and private water supplies intermingling in the industrial territory of northern New Jersey. The creation of still another, in the form of an independent industrial supply, would further complicate and confuse an absurd situation. The impressive industrial area in the counties of Bergen, Hudson, Passaic, Essex, Union and Middlesex has 33 independently owned, operated, and more or less competing water supplies. This inefficient lay-out is unparalled elsewhere in the United States.

(2) The present diversion of water through the canal, whatever it may be, and whatever our diversion rights in the canal, is definitely part of New Jersey's final share in the water from the channel of the Delaware River. The canal cannot be treated as an entity apart from the river.

(3) The mere fact that New Jersey has diverted this water for more than a century will not affect the ultimate attitude of New York and Pennsylvania toward the need for compensation water, as required of the former under the edict of the Supreme Court of the United States.

(4) This diversion was originally made for purposes of navigation which no longer obtains. We believe it is certain that if water originating in the shed of the river is now to be used for either industrial or potable purposes, it will be considered subject to the spirit, as well as the law, as set forth in the decree in the Delaware Diversion case.

(5) The contention that potable, or industrial, use of this water does not differ from the original diversion for purposes of navigation completely ignores the fact that in navigational use approximately one-half of the water diverted was returned to the Delaware at Trenton.

(6) New York is not now diverting, but when its project is completed and diversion begins, it is certain that any diversion by New Jersey via the canal will come under close scrutiny of both New York and Pennsylvania.

(7) The Court in the Diversion Case found that New York's request for 600 million gallons daily (Mgd.), if allowed, would "do more than substantial damage to lower riparian owners." Assuming only 160 Mgd. diversion by the canal, this quantity of diverted water, when added to New York's quota of 440 Mgd., equals the amount which the Court refused to grant New York. Obviously, this diversion via the canal will not be permitted without the building of a compensation reservoir to maintain the low flow of the river as fixed by the Court.

(8) The Court requirements for compensation water to cover the granted diversion of 440 Mgd. cost New York in excess of $18,000,000 for extra storage. Is it conceivable that New Jersey will be allowed to increase the total diversion from the River to the point where more than substantial damage will be done to lower riparian owners without being required to set up storage reservoirs on tributaries of the Delaware in New Jersey?

(9) New Jersey would be prohibited from diverting water from the Delaware River at all times when, because of a flow less than 0.5 cu. ft. per sec. per sq. mi. of watershed, New York was letting down from storage. For the years 1929 to 1933 we find that this would have covered 435 days, or considerably more than a year out of the five-year period. The longest period was 138 days in 1930. To be of any real use to New Jersey, therefore, sufficient storage to supply the users for at least 180 days would have to be provided by a storage reservoir. Such a reservoir cannot be built for less than $4,000,000.

(10) New Jersey should not take a part of its precious potential allotment of Delaware River water from below the confluence with the Lehigh. The pollution in the river is very heavy from there downstream and its prevention is entirely beyond present prospects of control.

(11) The contemplated diversion from the Delaware by way of the canal should be deferred until a comprehensive plan for utilization of the River has been developed.

(12) Use of the canal for recreation, and as a source of industrial water for New Brunswick, should be continued for the present. The locks, the banks in several places, and the viaduct over the Millstone River need repairing. We think the present beneficiaries of the canal will see that they do not fail, but there is no serious reason why the State should not put them in order.

(5) The contention that because of prior use of this water [illegible] ly one-half of the water diverted was returned to the Delaware at Trenton.

(6) New York is not now diverting, but when its project is completed and diversion begins, it is certain that any diversion by New Jersey via the canal will come under close scrutiny of both New York and Pennsylvania.

(7) The Court in the Diversion Case found that New York's request for 600 million gallons daily (mgd.), if allowed, would "do more than substantial damage to lower riparian owners." Assuming only 150 mgd. diversion by the canal, this quantity of diverted water, when added to New York's quota of 440 mgd., equals the amount which the Court refused to grant New York. Obviously, this diversion via the canal will not be permitted without the building of a compensation reservoir to maintain the low flow of the river as fixed by the Court.

(8) The Court's requirements for compensation water to cover the granted diversion of 440 mgd. cost New York in excess of $15,000,000 for extra storage. Is it conceivable that New Jersey will be allowed to increase the total diversion from the river to the point where more than substantial damage will be done to lower riparian owners without being required to set up storage reservoirs on tributaries of the Delaware in New Jersey?

(9) New Jersey would be prohibited from diverting water from the Delaware River at all times when, because of a flow less than 0.5 cu. ft. per sec. per sq. mi. of watershed, New York was prohibited from storage. For the years 1929 to 1933 we find that this would have occurred 455 days, or considerably more than a year out of the five-year period. The longest period was 150 days in 1930. To be of any real use to New Jersey, sufficient storage to supply the canal for at least 150 days would have to be provided by a storage reservoir. Such a reservoir cannot be built for less than $5,000,000.

(10) New Jersey should not take a part of its precious potential allotment of Delaware River water from below the confluence with the Lehigh. The pollution in the river is very heavy from there downstream and its prevention is entirely beyond present prospects of control.

(11) The contemplated diversion from the Delaware by way of the canal should be deferred until a comprehensive plan for utilization of the river has been developed.

(12) Use of the canal for recreation, and as a source of industrial water for New Brunswick, should be continued for the present. It leaks, to be sure, in several places, and the viaduct over the Millstone River needs reinforcing. We think the present beneficiaries of the canal will see that they do not fail, but there is no serious reason why the State should not put them in order.

(13) Johnson & Johnson are using, they say, approximately 2.5 million gallons of the canal water daily, chiefly in the manufacture of absorbent cotton. New Brunswick does not have sufficient supply in its reservoirs, nor is its 6-inch main across the city adequate to transmit such an additional quantity of water if the city were called upon to do so. It is significant that in their most recent expansion this Company has built two new and modern plants well beyond the limits of the City. Water for them is drawn directly from New Brunswick's Weston's Mills Reservoir and treated as required. The company is getting from the canal the water it needs at its plant within the city, and paying nothing for it.

In view of the foregoing, it is deemed inadvisable for the State to take action at this time looking to the development of the canal. No man is wise enough at this moment to foretell the future. To take over the canal now as a source of industrial water; to assume responsibility for repairing all its delapidated structures over its entire course of 50 miles, and maintaining it, would be to accept a white elephant into which hundreds of thousands of dollars of taxpayers' money could be poured with but a small return to the State, or to its citizens.

The canal has maintained itself without much care or expense for more than 10 years. It will probably do so for another 10 years. Long before the expiration of that period, we shall have a clearer view of where, and how, our share of the Delaware River ought to be used.

Therefore, the Commission recommends that, subject to necessary minimum repairs, the canal be kept in status quo for the duration.

STATE OF NEW JERSEY

SHIP CANAL AND WATER SUPPLY PROJECTS NORTHEASTERN NEW JERSEY

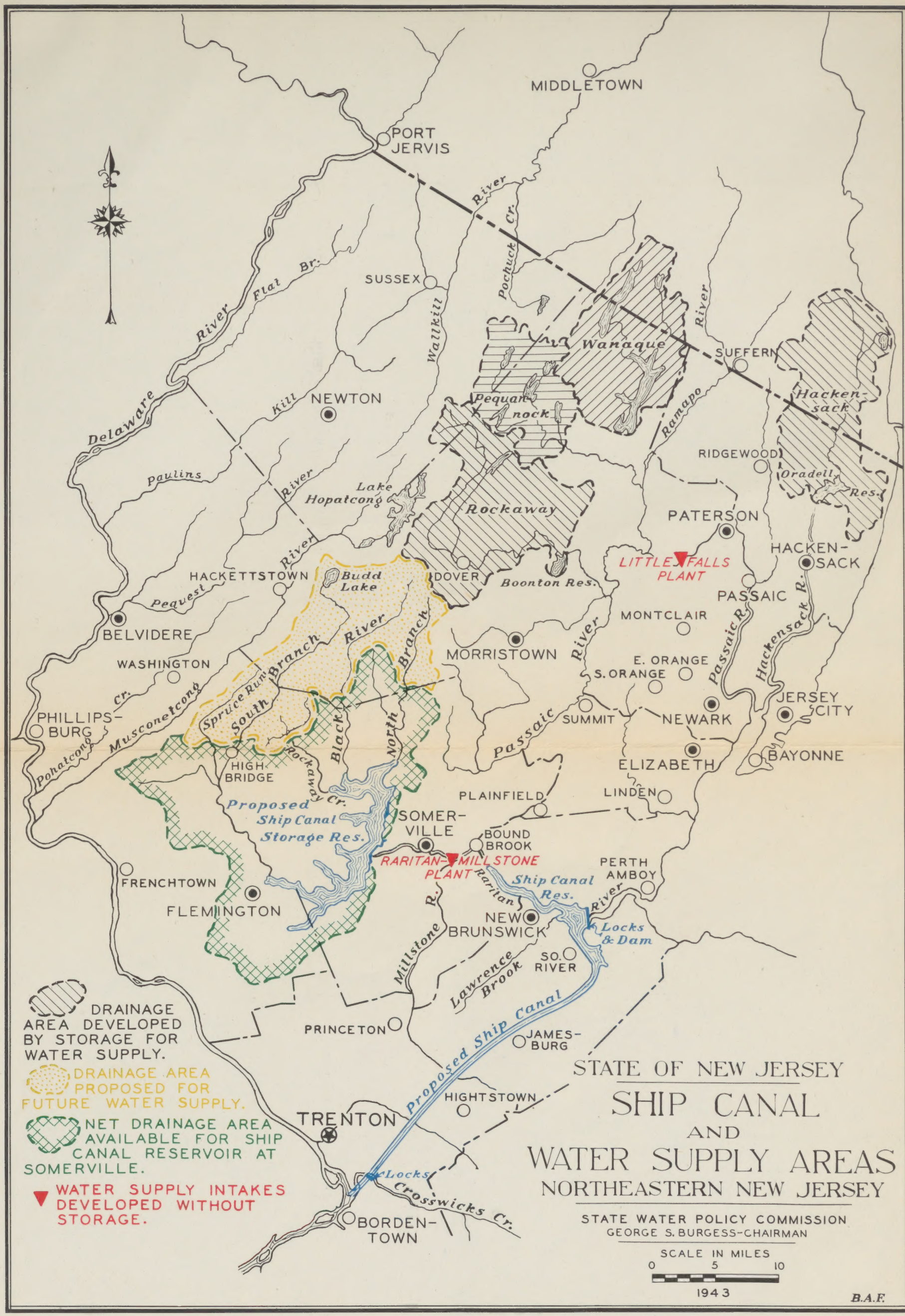
SCALE IN MILES
0 5 10

STATE WATER POLICY COMMISSION
GEORGE S. BURGESS – CHAIRMAN
1943

EXISTING TRANSMISSION MAINS
PROPOSED SHIP CANAL
BUNNVALE PROJECT
CHIMNEY ROCK PROJECT
DELAWARE & RARITAN CANAL PROJECT

B.A.F.

SUSSEX
NEW YORK
NEW JERSEY
Greenwood Lake
Flat Brook
Kill
NEWTON
WATER GAP
Paulins
River
Conistear Res.
Clinton Res.
Echo Lake
Oakridge Res.
Wanaque Res.
RAMSEY
Macopin Intake
Newark
Wanaque
Aqueduct
RIDGEWOOD
GLEN ROCK
H.W. Co.
New Milford Pump Sta.
Lake Hopatcong
Split Rock Pond
PATERSON
Conduits
FAIR-LAWN
LODI
Passaic Val. W. Comm.
Rockaway R.
Jersey City
Boonton Res.
Little Falls Pump Sta.
Aqueduct
HACKENSACK
Hackensack W. Co.
HACKETTSTOWN
Budd Lake
Pequest River
BELVIDERE
Black River
Bunn-vale Res.
D.&R. Compensat'g. Res.
Spruce Run
PHILLIPSBURG
Musconetcong
HIGH BRIDGE
North Branch
MORRISTOWN
Passaic R.
BELLEVILLE
Res.
Stony Hill Res.
Aqueduct
NEWARK
JERSEY CITY
Dock Watch Hollow Res.
Bunnvale
ELIZABETH
PLAINFIELD
Dock Watch Hollow Aquit.
LINDEN
SOMER-VILLE
BOUND BROOK
Eliz'town. W. Co.
Midd'sex. W. Co.
South Branch
FRENCHTOWN
D.&R. Pump Sta.
FLEMINGTON
Ship Canal Res.
Raritan
N.B.W.D.
River
PERTH AMBOY
Locks & Dam
NEW BRUNSWICK
SO. RIVER
Per. Amboy W. Dept.
RAVEN ROCK
DELAWARE
LAMBERTVILLE
South R.
JAMESBURG
PRINCETON
Delaware & Raritan Canal Conduit
Ship Canal
HIGHTSTOWN
Feeder
RIVER
TRENTON
Locks
BORDEN-TOWN
BURLINGTON
MOUNT HOLLY
CAMDEN


MIDDLETOWN
PORT JERVIS
River
Pochuck Cr.
SUSSEX
Wallkill
Flat Br.
River
Delaware
Kill
NEWTON
Wanaque
River
SUFFERN
Pequan-nock
Ramapo
Hacken-sack
RIDGEWOOD
Oradell Res.
Paulins
River
Lake Hopatcong
Rockaway
PATERSON
River
LITTLE FALLS PLANT
HACKEN-SACK
HACKETTSTOWN
Budd Lake
DOVER
Boonton Res.
Pequest
BELVIDERE
PASSAIC
MONTCLAIR
Passaic R.
Hackensack R.
WASHINGTON
Branch
River
Branch
MORRISTOWN
River
E. ORANGE
S. ORANGE
Cr.
Musconetcong
Spruce Run
South
Black
North
Passaic
SUMMIT
NEWARK
JERSEY CITY
PHILLIPS-BURG
Pohatcong
HIGH BRIDGE
Rockaway Cr.
ELIZABETH
BAYONNE
PLAINFIELD
LINDEN
Proposed Ship Canal Storage Res.
SOMER-VILLE
BOUND BROOK
RARITAN-MILLSTONE PLANT
PERTH AMBOY
FRENCHTOWN
FLEMINGTON
Raritan River
Ship Canal Res.
NEW BRUNSWICK
Millstone R.
Locks & Dam
SO. RIVER
Lawrence Brook
PRINCETON
JAMES-BURG
Proposed Ship Canal
HIGHTSTOWN
TRENTON
Locks
Crosswicks Cr.
BORDEN-TOWN
DRAINAGE AREA DEVELOPED BY STORAGE FOR WATER SUPPLY.
DRAINAGE AREA PROPOSED FOR FUTURE WATER SUPPLY.
NET DRAINAGE AREA AVAILABLE FOR SHIP CANAL RESERVOIR AT SOMERVILLE.
WATER SUPPLY INTAKES DEVELOPED WITHOUT STORAGE.
STATE OF NEW JERSEY
SHIP CANAL
AND
WATER SUPPLY AREAS
NORTHEASTERN NEW JERSEY
STATE WATER POLICY COMMISSION
GEORGE S. BURGESS-CHAIRMAN
SCALE IN MILES
0 5 10
1943
B.A.F.